

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 176/61641	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/US2004/030644	International filing date ( <i>day/month/year</i> ) 20 September 2004 (20.09.2004)	Priority date ( <i>day/month/year</i> ) 19 September 2003 (19.09.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant UNIVERSITY OF ROCHESTER		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 <i>bis</i> .1(a).																								
2.	This REPORT consists of a total of 7 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 40%;">Box No. I</td> <td style="width: 50%;">Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input checked="" type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 24 April 2007 (24.04.2007)
Facsimile No. +41 22 338 82 70	Authorized officer <div style="text-align: center; font-weight: bold; margin-top: 10px;">Yoshiko Kuwahara</div> e-mail: pt07.pct@wipo.int

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
EDWIN V. MERKEL  
NIXON PEABODY LLP  
CLINTON SQUARE, P.O. BOX 31051  
ROCHESTER, NY 14603-1051

# PCT

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 176/61641		Date of mailing (day/month/year) <b>03 APR 2007</b> <b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No. PCT/US04/30644	International filing date (day/month/year) 20 September 2004 (20.09.2004)	Priority date (day/month/year) 19 September 2003 (19.09.2003)
International Patent Classification (IPC) or both national classification and IPC IPC: C12Q 1/68( 2006.01);C12M 1/00( 2006.01) C07H 21/02( 2006.01) USPC: 435/6,283.1;536/23.1		
Applicant UNIVERSITY OF ROCHESTER		

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 06 March 2007 (06.03.2007)	Authorized officer  Christopher M. Babic Telephone No. 571-272-1600
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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/30644

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☒ table(s) related to the sequence listing

b. format of material

- ☒ on paper  
☐ in electronic form

c. time of filing/furnishing

- ☒ contained in the international application as filed.  
☐ filed together with the international application in electronic form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US04/30644

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☐ paid additional fees
  - ☐ paid additional fees under protest and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
See the lack of unity section of the International Search Report (Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:

- ☐ all parts.
- ☒ the parts relating to claims Nos. Claims 1-23 and SEQ ID NO: 1

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US04/30644

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>7-21</u>	YES
	Claims <u>1-6, 22, and 23</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-23</u>	NO
Industrial applicability (IA)	Claims <u>1-23</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Please See Continuation Sheet

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US04/30644

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

1. Claim(s) 1-6, 22, and 23 lack novelty under PCT Article 33(2) as being anticipated by Nietuspki et al. (U.S. 5,582,974).

Initially, it is noted that the terms --sensor device-- and --detector-- are not defined in any limiting manner within the specification, and thus are interpreted at the broadest reasonable interpretation of one of ordinary skill in the art.

Nietuspki teaches a dot blot analysis of probe hybridization behavior utilizing probes complementary nucleic acid from an otolaryngologic pathogen, i.e. *Staphylococcus aureus* (col. 7-14, example 1, for example). Specifically, Nietuspki teaches a method comprising: providing a sensor device comprising (i) a substrate having two or more nucleic acid probes respectively confined to two or more distinct locations thereon (col. 7, lines 20-30, immobilized oligonucleotide probes, for example), and (ii) a detector that detects the binding of target nucleic acids of a biological sample to the two or more nucleic acid probes, wherein a target nucleic acid is specific to one or more otolaryngologic pathogens (col. 7, lines 55-65, X-ray film/machine, for example); exposing the biological sample, or a portion thereof, to the sensor device under conditions effective to allow hybridization between the two or more nucleic acid probes and a target nucleic acid to occur; and detecting with the detector whether any target nucleic acid hybridizes to the two or more nucleic acid probes, wherein hybridization indicates presence of the otolaryngologic pathogen in the biological sample and presence of more than one otolaryngologic pathogen can be detected simultaneously (col. 7, lines 55-65, 30-45, for example). It is submitted that the teachings of Nietuspki anticipate the claimed invention, in part, because one of ordinary skill in the art would consider a dot blot assay to contain a --sensor device-- and --detector--, without any limiting definition of the terms, thus anticipating every embodiment of the claimed invention.

2. Claim(s) 1-6, 22, and 23 lack novelty under PCT Article 33(2) as being anticipated by Hogan (WO 00/66789 A2).

Hogan teaches multiplex probe hybridization assays (col. 7-14, example 1, for example) utilizing probes complementary nucleic acid from an otolaryngologic pathogen, i.e. *Staphylococcus aureus* (pg. 49, lines 40-45, for example), as well as well known DNA microchips (pg. 52, apparatus, for example) and complementary detection systems (pg. 51, detection systems, for example) thus anticipating every embodiment of the claimed invention.

3. Claim(s) 7-20 lack an inventive step under PCT Article 33(3) as being obvious over Hogan (WO 00/66789 A2) in view of Bruchez et al. (U.S. 2002/0039732 A1).

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Hogan does not expressly teach the use of nanocrystal sensor devices or molecular beacon probes. It is submitted that these detection systems were well known in the art at the time of invention as demonstrated by Bruchez ([0035]-[0230], for example). Hogan further highlights that the detection systems allow for the detection of a plurality of different target oligonucleotides in a multiplex/homogeneous real-time format.

Thus, it would have been *prima facie obvious* to one of ordinary skill in the art at the time of invention to incorporate the detection systems demonstrated by Bruchez into the methods of Hogan since Bruchez suggests such a modification allow a multiplex/homogeneous real-time detection format.

4. Claim(s) 21 lack an inventive step under PCT Article 33(3) as being obvious over Hogan (WO 00/66789 A2) in view of Takako (JP 6090798).

Hogan does not expressly teach the use of probes comprising SEQ ID NOs: 1. Takako teaches a segment of the *Staphylococcus aureus* 16S rRNA gene sequence including SEQ ID NO:1 that is useful for developing probes for detection of *Staphylococcus aureus*.

Since the claimed probe simply represents a structural homolog, which are derived from sequences suggested by the prior art as useful for probes of the *Staphylococcus aureus* 16S rRNA gene sequence and concerning which a biochemist of ordinary skill would attempt to obtain alternate compounds with improved properties, the claimed probe is *prima facie obvious* over the cited references in the absence of secondary considerations.



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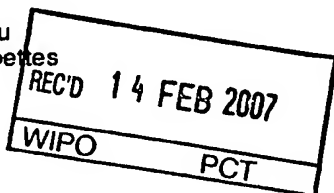
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Date

12-02-2007

Reference  
NIXBW/P35147EP

Application No./Patent No.  
04784495.6 - 2305 PCT/US2004030644 / ISA US

Applicant/Proprietor  
UNIVERSITY OF ROCHESTER

For the aforementioned international application, you are hereby kindly requested to forward to the EPO in its capacity as designated / elected Office:

- ☒ a) The publication of the international search report (Art. 20 PCT).
- ☐ b) the copy of the international preliminary examination report (Art. 36(3)(a) PCT).
- ☐ c) the copy (copies) of the priority document(s). If any document is not available and ISA is not the EP, please indicate below whether the receiving Office has been requested to transmit the document to the International Bureau (Form PCT/RO/101, Box VI; R. 17.1(b) PCT).
- ☐ .....

Receiving Section

EPO-DG 1  
23. 02. 2007

Thanks!

Van den Heuvel, Marcel

Answer of the International Bureau [IB]:

- ☒ The requested item [a), b) or c)] is not available with the IB.

Reason: **THE REQUESTED DOCUMENT HAS NOT BEEN RECEIVED AT THE IB** *US*

For priority documents [c)] with ISA not EP:

- ☐ The applicant has requested the receiving Office to issue a priority document [c)] pursuant to Rule 17.1(b) PCT, but the IB did not receive it.

The International Bureau